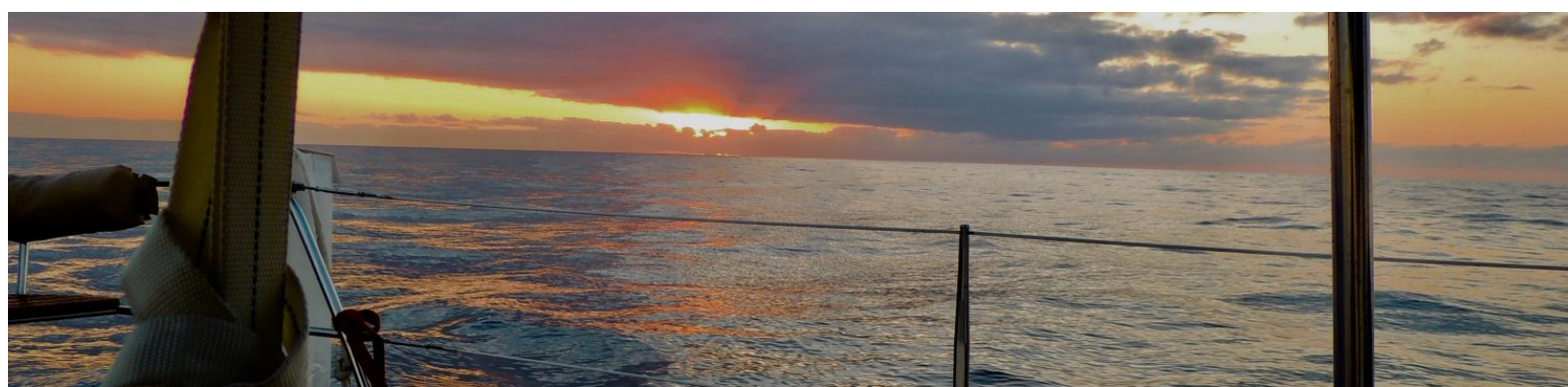


Our Crumbling Infrastructure: How the Aging of America's Infrastructure is a Homeland Security Concern

Him, an adventurer, CISO, soldier, Marine, law officer, author, professor, spy, yachty, motorcyclist, photographer. Her, was the church lady librarian, got divorced, joined a motorcycle gang, became a hacker, and world adventurer.



POLITICS

Our Crumbling Infrastructure: How the Aging of America's Infrastructure is a Homeland Security Concern

by [Sydney Liles](#) • July 29, 2008 • [2 Comments](#)

Abstract

Americans are an automotive nation. We celebrate our cars and we revel in the freedom of the open road. Much of this car culture is due to our extensive network of interstate highways and bridges that criss-cross the nation connecting the nation. This is part of our critical infrastructure and built as a part of our national defense plan. Presidents continue to address the importance of this network of roads. The new focus on terrorism has the government looking at all parts of the infrastructure for vulnerabilities and ways to protect them. While the highways and bridges are part of the critical infrastructure, they have been neglected in the most basic need to keep them well maintained and in good repair. This paper addresses both the costs of this maintenance and repair and some potential reasons for the neglect.

Our Crumbling Infrastructure: How the Aging of America's Infrastructure is a Homeland Security Concern

September 11, 2001 changed not only American lives and American thinking, but it also changed how the U.S. government thinks about security and protection. Shortly after the terrorist attacks in New York and Washington D.C., the Department of Homeland Security was created and tasked with identifying America's critical infrastructure and ways to protect these national assets.

Since 2001, the U.S. has seen a number of infrastructure failures. In 2003 the power grid serving the Northeast, much of the Midwest and parts of Canada failed leaving an estimated 50 million people without power ("Blackouts cause N America chaos," 2003). In 2005 the levees protecting New Orleans from flooding failed during Hurricane Katrina and Lake Pontchartrain spilled in to the streets in one of the worst natural disasters in U.S. history (Mittal, 2005). 2007 saw multiple infrastructure failures including the I-35 bridge collapse in Minneapolis (Flynn, 2007b; Lohn, 2007), a massive sink hole in San Diego (Hoffman, 2007) and the rupture of steam pipes in New York City (Barron, 2007). These are the infrastructure failures that make headlines. There are numerous other examples seen daily that never make the news because they do not appear to be that serious. These are the deteriorating roads experienced on virtually every interstate highway in the United States.

Problem Statement

It appears that the increased spending on infrastructure security is diverting funds from infrastructure maintenance and is contributing to the crumbling U.S. infrastructure. This paper will examine the current condition of highways and bridges in the United States, the associated costs of repair and maintenance as well as the sources for funding these projects and the costs and funding of transportation security projects. The scope of this paper will be limited to highways and bridges rather than including all physical infrastructures even though the effects of age can be seen in all types of infrastructure.

The Condition of U.S. Highways and Bridges

The United States Interstate highway system was created by President Eisenhower when he signed the National Interstate and Defense Highways Act of 1956. This legislation created more than 40,000 miles of roads and connected the United States in ways previously unimagined (Weingroff, 1996). Most of the highways and bridges Americans travel today were completed during the 1960s and 1970s. Stephen Flynn, in his discussion of the I-35 bridge collapse points out that both age and heavy use likely contributed to the failure of Bridge 9340, which was completed in 1967 (Flynn, 2007b). Flynn continues to point out that the I-35 Bridge collapse is only one symptom of the aging infrastructure in American.

The I-35 bridge collapse highlighted the potential for disaster on bridges. The Department of Transportation keeps a complete inventory of all bridges and their conditions. These maps and tables of structurally deficient bridges became the subject of a great deal of discussion in the days and weeks that followed the Minnesota collapse. Governors across the nation ordered new inspections of bridges within the borders of their states (Arsenault, 2007; Ebbert & Levenson, 2007; Golab, 2007; Kelly, 2007). All of this data is and has been publicly available for many years. In Indiana there are 105 bridges listed as structurally deficient (*Structurally Deficient Bridges on the National Highway System, Indiana*, 2007). How many people rushed to look at the maps of these bridges after the I-35 bridge collapsed only to be disturbed by the number of these bridges they travel on a daily basis? And how many of these bridges have been scheduled or are currently under going significant structural repair? The truth is that most people tried to reassure themselves that “structurally deficient” is a broad term and can include a variety of problems “Typically the finding means inspectors have identified some kind of deterioration, cracks or movement.”(Chan, 2007)

The United States has almost 4 million miles of roads table 1-1 (Nguyen, 2006). Road conditions are listed as very good, good, fair, mediocre and poor. While the majority of roads fall in the top half of the scale (120,102 are very good, 259,314 are good, and 386,931 are fair) the number of miles of roads that fall below are troubling (95,890 are mediocre and 64,860 are poor) table 1-4 (Nguyen, 2006). There are 592,473 bridges in the United States and of those, 75,621 were listed as structurally deficient as of 2005 and 79,523 were listed as functionally obsolete that same year table 1 -7 (Nguyen, 2006).

The United States has an expansive network of roads and bridges connecting the country. This transportation system used to be the envy of the world. More recently, the roads and bridges have been showing their age, with many of them more than 40 years old.

Highway and Bridge Maintenance Costs and Funding

Highways, roads, and bridges are funded by a combination of federal and state monies. In 2003 all states combined spent \$72,455,000 on highways table 6-8 (Nguyen, 2006). During that same time states collected \$55,347,000 in transportation revenues table 6-9 (Nguyen, 2006). In 2007, the U.S. Department of Transportation apportioned \$4,857,945,785 for interstate maintenance and \$5,932,462,722 for the national highway system table 1. There are 20 tables of data listing the funds apportioned, distributed, reserved and available through the U.S. Department of Transportation for fiscal year 2007. These include special programs for air quality improvement and congestion mitigation programs (*Supplementary Tables — Apportionments Authorized for Fiscal Year (FY) 2007 Pursuant to the SAFETEA-LU and the Continuing Apportionment Resolution*, 2007).

These are huge sums of money and yet local authorities still struggle to find funding for their local projects (Gehrke, 2006; Region, 2005). In spite of the apparent wealth of funding for interstates and highways, funding seems to fall short. Representative James Oberstar announced a new National Bridges Plan just after the I-35 bridge collapsed saying, “there are 73,784 bridges in the country rated “structurally deficient” by the U.S. Department of Transportation. He said a major reason why these bridges are not repaired, rehabilitated, or replaced can be attributed to a “tombstone mentality” in the Federal Government and in the States.” (Oberstar, 2007) Oberstar’s initiative plans on repairing or replacing the nation’s bridges.

Although money is being collected, allocated and spent on highways and bridges as documented in the Department of Transportation reports, there is still a shortfall. An article in *The Economist* states the problem like this: “The problem with America’s infrastructure is not that drivers are in danger of being pitched into rivers. Dramatic events may dominate the news, but the nation’s roads and bridges are less perilous than inefficient and decrepit. Enormous sums are being spent just to keep them in a mediocre state.” (“America’s creaking infrastructure: A bridge too far gone,” 2007) *The Economist* goes on to say that while spending on infrastructure has gone up in the decades since the 1950s, labor, rights-of-way, wider roads, stricter safety standards, and sharply increased costs of supplies have combined so that the funds available do not stretch as far as they had in the past. And finally, the fuel taxes that have provided much of the money required have not increased to cover losses caused by greater fuel efficiency and alternative fuels. “America has been slow to find alternative ways of paying for new projects or for rationing the use of existing ones.” (“America’s creaking infrastructure: A bridge too far gone,” 2007)

Are Highways and Bridges Critical Infrastructure?

President Dwight D. Eisenhower believed that the United States needed an interstate highway system as part of its defense; “a modern network of roads is as necessary to defense as it is to our national economy and personal safety.” (Weingroff, 1996) While Eisenhower saw the necessity of the interstate highway system, the question remains: Are the nation’s highways and bridges part of the critical infrastructure? Homeland Security Presidential Directive 7 answers this question. “The Secretary shall coordinate protection activities for each of the following critical infrastructure sectors: information technology; telecommunications; chemical; *transportation systems, including mass transit, aviation, maritime, ground/surface, and rail* and pipeline systems; emergency services; and postal and shipping.” Emphasis mine (Bush, 2003). Bullock, et al also describe transportation as part of the critical infrastructure in chapter 5 of their book *Introduction to Homeland Security*, specifically the roadways and trucking as they are the most likely locations for hazardous materials incidents. (Bullock & Haddow, 2006)

Highway and Bridge Security Funding

Transportation is clearly part of the nation’s critical infrastructure and as provided by HSPD-7 must be protected. Protection is rarely free, so there must also be a way to fund the security of the nation’s transportation systems. The CIP Report out of George Mason University dedicated its March 2007

issue to the topic of transportation security. This report details \$445 million in transportation security grants for fiscal year 2007. There are five grant programs; Port Security Grant Program, Transit Security Grant Program, Buffer Zone Protection Grant Program, Intercity Bus Security Grant Program and Trucking Security Grant Program. In addition, the President's budget for homeland security is summarized to include the following for the protection of the critical infrastructure: \$30 million for the Securing the Cities Implementation initiative, \$21.9 million for the Science and Technology (S&T) Office of Innovation, \$15 million to improve Chemical Security, \$3.5 million to expand TSA's National Explosive Detection Canine Team program and \$35.6 million for the Presidential Campaign Secret Service. (McCarthy, 2007) In fact, the federal government provides a complete listing of grants available to states for the purpose of transportation security, not one grant is for the maintenance, repair or replacement of the bridges or highways (AASHTO, 2004).

Conclusion

Americans are an automotive nation. We celebrate our cars and we revel in the freedom of the open road. Much of this car culture is due to our extensive network of interstate highways and bridges that criss-cross the nation connecting the nation. This is part of our critical infrastructure and built as a part of our national defense plan. Presidents continue to address the importance of this network of roads. The new focus on terrorism has the government looking at all parts of the infrastructure for vulnerabilities and ways to protect them. While the highways and bridges are part of the critical infrastructure, they have been neglected in the most basic need to keep them well maintained and in good repair.

Stephen Flynn reminds us that the I-35 bridge collapse is just one of the disasters the United States will face due not to terrorist attacks, but to the aging and crumbling infrastructure (Flynn, 2007a). Flynn chides the country saying, "The fact is that Americans have been squandering the infrastructure legacy bequeathed to us by earlier generations. Like the spoiled offspring of well-off parents, we behave as though we have no idea what is required to sustain the quality of our daily lives." (Flynn, 2007b) The condition of our interstates, highways, roads and bridges is deteriorating. We see it every day as we drive to and from work and school. Repairs and maintenance are expensive so for the most part we focus our efforts and our money on repairs and the maintenance never gets done. States are spending the money they receive for work on the interstate highway system, but the money simply does not stretch to cover all of the needed work. So while our nation's highway system, once meant for national defense continues to crumble, the missing piece for protecting this critical infrastructure is including maintenance, repair and replacement on the list of tasks designed to protect and secure this part of the critical infrastructure.

References

- AASHTO, A. A. o. S. H. a. T. O. (2004). *Security Funding Resources: A Reference Guide for State Transportation Agencies*. Retrieved from <http://cms.transportation.org/sites/security/docs/20-59-Final.html>.
- America's creaking infrastructure: A bridge too far gone [Electronic (2007). Version]. *The Economist*. Retrieved 11/17/2007 from http://www.economist.com/world/na/displaystory.cfm?story_id=9621456.
- Arsenault, M. (2007). R.I. bridge conditions rank worst in the nation [Electronic Version]. *The Providence Journal*. Retrieved 11/17/2007 from http://www.projo.com/news/content/Bridge_Safety_08-03-07_1S6K0CH.36ff8ea.html.
- Barron, J. (2007). Steam Blast Jolts Midtown, Killing One [Electronic Version]. *The New York Times*. Retrieved 11/17/2007 from <http://www.nytimes.com/2007/07/19/nyregion/19explode.html>.
- Blackouts cause N America chaos [Electronic (2003). Version]. *BBC News*. Retrieved 11/17/2007 from <http://news.bbc.co.uk/1/hi/world/americas/3152451.stm>.
- Bullock, J. A., & Haddow, G. (2006). *Introduction to Homeland Security*: Butterworth-Heinemann.
- Bush, G. W. (2003). *Homeland Security Presidential Directive/Hspd-7: Critical Infrastructure Identification, Prioritization, and Protection*. Retrieved 11/17/2007. from <http://www.whitehouse.gov/news/releases/2003/12/20031217-5.html>.
- Chan, S. (2007). In Ways Large and Small, Many Bridges Meet Definition of 'Deficient' [Electronic Version]. *The New York Times*. Retrieved 11/17/2007 from <http://www.nytimes.com/2007/08/03/nyregion/03spans.html>.
- Ebbert, S., & Levenson, M. (2007). 588 Mass. bridges 'deficient': State poring over records of faulty spans [Electronic Version]. *Boston Globe*. Retrieved 11/17/2007 from http://www.boston.com/news/local/articles/2007/08/03/588_mass_bridges_deficient/.
- Flynn, S. (2007a). 5 Disasters Coming Soon If We Don't Rebuild U.S. Infrastructure [Electronic Version]. *Popular Mechanics*. Retrieved 10/19/2007 from http://www.popularmechanics.com/science/worst_case_scenarios/4227310.html.
- Flynn, S. (2007b). Minneapolis Bridge Collapse Reveals Fragile Infrastructure [Electronic Version]. *Popular Mechanics*. Retrieved 8/2/2007 from <http://www.popularmechanics.com/technology/transportation/4219981.html>.
- Gehrke, C. (2006). Road Maintenance Costs and Funding: Hells Canyon National Recreation Area. *Science & Policy Briefs* Retrieved 11/17/2007, 2007, from <http://www.wilderness.org/Library/briefs.cfm>

Golab, A. (2007). Chicago's Bridges: How Safe are They?; Governor orders inspections [Electronic Version]. *Chicago Sun-Times*. Retrieved 11/17/2007 from http://findarticles.com/p/articles/mi_qn4155/is_20070803/ai_n19440962.

Hoffman, A. (2007). 4-Lane Road Buckles, Sinks in San Diego [Electronic Version]. *ABC News*. Retrieved 10/3/2007 from <http://abcnews.go.com/US/wireStory?id=3684367>.

Kelly, A. (2007). Governor requests review of Arizona bridge safety [Electronic Version]. *Arizona Daily Star*. Retrieved 11/17/2007 from <http://64.233.167.104/search?q=cache:18LcPr8SABsJ:www.azstarnet.com/sn/dailystar/194702+structurally+deficient+bridges+governor&hl=en&ct=clnk&cd=7&gl=us>.

Lohn, M. (2007). MN bridge collapse carries costly toll [Electronic Version]. *Mercury News*. Retrieved 10/2/2007 from http://www.mercurynews.com/natbreakingnews/ci_7061106?nclink_check=1.

McCarthy, J. A. (2007). \$445Million for FY 2007 Transportation Security Grants. *The CIP Report*, 5(9), 2 and 14.

Mittal, A. (2005). *Army Corps of Engineers Lake Pontchartrain and Vicinity Hurricane Protection Project*. Retrieved 11/17/2007. from www.gao.gov/new.items/d051050t.pdf.

Nguyen, L. X. (2006). *State Transportation Statistics*. Retrieved 11/17/2007. from http://www.bts.gov/publications/state_transportation_statistics/state_transportation_statistics_2006/.

Oberstar, J. (2007). *Oberstar Announces National Bridge Plan*. Retrieved 11/17/2007. from http://oberstar.house.gov/index.asp?Type=B_PR&SEC=%7B3E3F0C73-EDA7-4A04-B371-B9F754B8B25F%7D&DE=%7BCB17D90C-DCEF-45CC-AF61-CFD437AFA420%7D.

Region, S. (2005). Metropolitan Transportation Plan MTP2030 [Electronic Version]. *Issue Brief*. Retrieved 11/17/2007 from [www.sacog.org/mtp.Structurally Deficient Bridges on the National Highway System, Indiana](http://www.sacog.org/mtp.Structurally%20Deficient%20Bridges%20on%20the%20National%20Highway%20System,%20Indiana) (Cartographer). (2007).

Supplementary Tables — Apportionments Authorized for Fiscal Year (FY) 2007 Pursuant to the SAFETEA-LU and the Continuing Apportionment Resolution. (2007). Retrieved 11/16/2007. from.

Weingroff, R. F. (1996). Federal-Aid Highway Act of 1956: Creating the Interstate System. *Public Roads*, 60(1).

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America's Crumbling Infrastructure. Millions in the United States believe their lifestyles filled with modern conveniences will continue forever. But the underpinnings of the country—including its electrical grids and transportation systems—tell a different story. Justin Sullivan/Getty Images. Weakened structures: A large pothole forms in a street in San Francisco, California (July 28, 2015). Since then, public infrastructure spending as a share of GDP has declined to about half the European level. Public Transportation: "America's public transit infrastructure plays a vital role in our economy, connecting millions of people with jobs, medical facilities, schools, shopping, and recreation, and it is critical to the one-third of Americans who do not drive cars. America's Democratic Infrastructure Is Crumbling. HR1 won't become law any time soon, but it's got the right ideas for fixing our electoral system. By. Mark Gongloff is an editor with Bloomberg Opinion. He previously was a managing editor of Fortune.com, ran the Huffington Post's business and technology coverage, and was a columnist, reporter and editor for the Wall Street Journal. Read more opinion Follow @markgongloff on Twitter. COMMENTS. U.S. Infrastructure Given a D+ Grade. Although nearly everyone in government, engineering, and construction agrees that the country's infrastructure is faring poorly, no one seems to know how to solve what has become a massive problem. A 60 Minutes report pointed out that one in every nine bridges across the country – for a total of 70,000 bridges – is considered structurally deficient. Ray LaHood, the co-chairman of a bipartisan group committed to fixing the infrastructure problem, says the infrastructure in the U.S. is "on life support." The ASCE agrees. In fact, it gave U.S. infrastructure America's infrastructure is a mess, and experts say it could take upward of \$4.5 trillion to fix it. Yet Washington has yet to ratify a bipartisan plan. These five states are in the roughest shape, reveals the CNBC 2019 America's Top States for Business study. America's infrastructure is a mess. And with the Trump administration and Congress unable to fast-forward a bipartisan plan to address the issue, things are only getting worse. According to the 2017 American Society of Civil Engineers report card, published every four years, the U.S. needs to spend some \$4.5 trillion by 2025 to fix the country's roads, bridges, dams and other infrastructure.